STYLOCHOPLANA PARASITICA SP. NOV., A POLYCLAD PARASITIC IN THE PALLIAL GROOVE OF THE CHITON

KOJIRO KATO (加藤 光次郎)

Mitsui Institute of Marine Biology, Shimoda,
Shizuoka-ken, Japan

ONE PLATE AND TWO TEXTFIGURES

(Received Mar. 12, 1935)

The polyclad serving as basis for this article is found in the pallial groove of *Liolophura japonica* var. *tessellata*, a common chiton occurring between tide-marks in the vicinity of the Mitsui Institute of Marine Biology near Shimoda. This planarian belongs to the group A (Bock, 1913) of the genus *Stylochoplana*, and without a doubt represents a species new to science, for which I give the name *Stylochoplana parasitica*. Under the group A have hitherto been recorded five European species, *S. maculata*, *agilis*, *palmula*, *taurica*, *tarda* and one Japanese species, *S. pusilla*. Of the six species the last one alone is parasitic usually infesting the mantle cavity of *Monodonta labio* (Kato, 1934), while the other five are free living forms. The present species is related to *maculata* rather closely than to *pusilla*, but it may readily be distinguished from these and other species by its external as well as internal features.

The parasites are present in summer in nearly half the number of individuals of *Liolophura*, while they are somewhat less in number in autumn. On rare occasions *Liolophura japonica* serves as host, but in no case have I found the worm infesting *Acanthochiton* or *Onithochiton*, although they live together with *Liolophura*. This selection of host can easily be observed experimentally by putting the planarians and different species of chitons in the same vessel. In summer a single host harbors from one to ten planarians. Generally the animal is found

Annot. Zool. Japon., Vol. 15, No. 1. 1935

creeping about the gill or in the pallial groove of the host. The planarians taken out of the host live for a few days, but they gradually undergo disintegration.

The body is moderately firm and has an elongated oval shape, its anterior end being a little broader than the posterior. In the fully-expanded state the large animal measures 14 mm in length and 4 mm in width, while the smallest individual with well developed genital organs is nearly half as large.

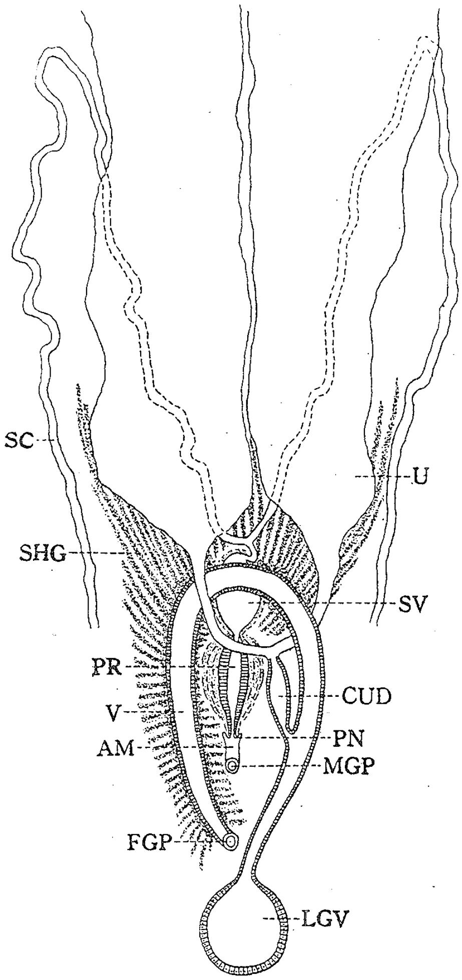


Fig. 1. Genital organs of *Stylochoplana parasitica* sp. nov., in horizontal section, diagrammatic. × 60. *AM* antrum masculinum, *CUD* common uterine duct, *FGP* female genital pore, *LGV* Lang's glandular vesicle, *MGP* male genital pore, *PN* penis, *PR* prostate gland, *SC* seminal canal, *SHG* shell gland, *SV* seminal vesicle, *U* uterus, *V* vagina.

The ground color of the body is milky white and totally destitute of such color markings as are found on *S. pusilla* and *maculata*. The intestine is light-brown, and the ovaries and uteri are white.

At a distance of about one-sixth the body-length from the anterior extremity are found a pair of the rudimentary tentacles formed by slight elevations of the epidermis. At the base of the tentacle are closely disposed tentacular eye-spots (7-18). Cerebral eye-spots (11-28) are scattered over the brain region on either side of the median line.

The epidermis consists of columnar ciliated cells of almost equal height on both dorsal and ventral sides and are found to contain neither special secretion nor gland save for some minute rhabdites. The dermal musculature like that of other species is made up of three layers, the middle of which is separated again into three layers, two diagonals and a circular layer in between. Both the inner and outer layer consist of longitudinal fibres. The inner longitudinal layer is wanting in the dorsal musculature. In addition to these layers a thin circular muscle layer is present immediately beneath the basement membrane.

Situated slightly in front of the middle of the body is the mouth which leads into the pharyngeal chamber. The pharynx is plicated and extends about one-fourth the entire body-length. The main trunk of the intestine runs along the median line and gives off five pairs of lateral branches which are ramified, but not anastomosed.

The testes are distributed chiefly in the ventral parts of the body. The much coiled seminal canal proceeds anteriad along each side from about the level of the seminal vesicle to a little behind the posterior end of the pharynx, where it bends abruptly inward and backward to run for a considerable distance and eventually the two unite in the median line into a single duct. This short common duct continues to the moderately wide seminal vesicle surrounded by the muscular wall with the outer nucleated zone. The seminal canals and vesicle are found distended with spermatozoa in all the specimens examined. The seminal vesicle gradually narrows backward and by a narrow canal is continuous with the prostate gland. The latter makes its way by the narrow ejaculatory duct to the obliquely situated, nearly cylindrical antrum masculinum at the tip of the small, rudimentary penis, which is destitute of stylets. The prostate gland is a fairly large, elongate pear-shaped organ lined with tall cylindrical, ciliated cells and covered with the well-developed musculature. Numerous efferent ducts of the extra-capsular prostate glands pierce through the musculature. In *S. pusilla* and *S. maculata*, the musculature of the seminal vesicle is as thick as that of the prostate, but in the present species the former is much thinner. The male genital pore is situated at about one-sixth the body-length from the hind extremity.

The female genital pore lies immediately behind the male pore, but the two are clearly separated as in those of *S. maculata*. The vagina extends as far forward as the level of the seminal vesicle, where it turns abruptly dorsad and backward and runs for a short distance to be continuous with the duct of Lang's glandular vesicle or accessory vesicle. The latter is a moderately large spherical body containing a mass of spermatozoa. At the junction of the vargina and the duct of Lang's vesicle, opens a common uterine duct formed by the union of the uteri, which run forward to the brain region alongside the pharyngeal chamber. In the present species the portion of the vagina curving dorsad is as long as the duct of Lang's vesicle, but in *S. pusilla* the former is far shorter than the latter and in *S. maculata* the proportion is reversed. Consequently the opening of the common uterine duct is different in each species. Surrounding the vagina are observed a large mass of eosinophilous secretions which have been carried from the shell-glands scattering in the parenchyma under the dermal musculature. The ovaries are distributed in the dorsal half of the body.

During summer and autumn the planarian deposits eggs on the hyponotum of the host along the margin of the pallial groove. The cocoon is irregular in shape and of a light brownish color. Large ones measure 7 mm in length and 2 mm in width. In summer the larva hatches out in the aquarium in about ten days after its deposition. It is oval in shape and is covered with polygonal ciliated cells containing minute brownish-purple granules. At the boundaries of the cell covering the whole body surface are found small, light yellow bodies which are very refringent. Along the margin of the body are eleven strong sensory hairs accompanied by weak cilia as are shown in the figure. Two pairs of large eye-spots are present, the anterior of which is slightly larger than the posterior. The former are divided to the cerebral eye-spots and the latter the tentacular eye-spots. A large ovoidal pharynx is situated in the hinder part of the body. The mouth lies at its center. The intestine runs along the long axis of the body and gives off three pairs of branches. The middle pair again are divided into three. The larva shows strong positive phototropism and leaves the host immediately after hatching.

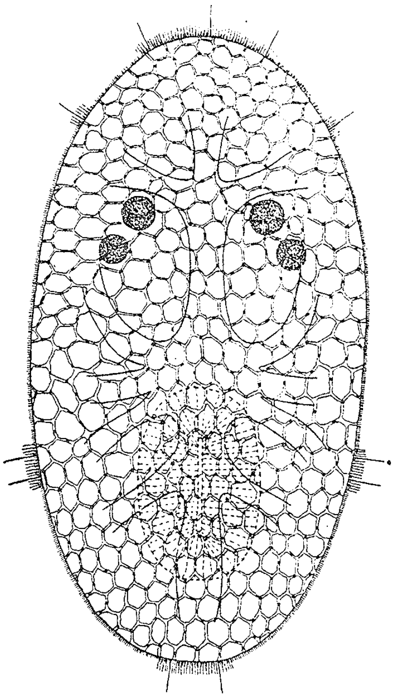


Fig. 2. Newly hatched larva of *S. parasitica.* × 350.

LITERATURE

Bock, S. 1913 Studien über Polycladen. Zoologiska Bidrag från Uppsala, Bd. 2.

—— 1924 Eine neue *Stylochoplana* aus Japan. Arkiv för Zoologi, Bd. 16.

Graff, L. von. 1878 Kurze Berichte über fortgesetzte Turbellarienstudien. 1. Zeitschr. f. Zool., Bd. 25. Suppl.

Jacubowa, L. 1909 Les polyclades de la Baie de Sébastopol. St. Petersbourg Mém. Acad. Sci., Ser. 8, T. 24.

Kato, K. 1934 Polyclad turbellarians from the neighborhood of the Mitsui Institute of Marine Biology. Japan. Jour. Zool., vol. 6, no. 1.

Lang, A. 1884 Die Polycladen. Fauna und Flora des Golfes von Neapel.

Quatrefages, A. 1845 Etude sur les types inferieurs de l'embranchement des annelés. Mémoire sur quelques planariées marines appartenant aux genres *Tricelis* (Ehr.), *Polycelis* (Ehr.), *Prosthiostomum* (Nob.), *Proceros* (Nob.), *Eolidiceros* (Nob.) et *Stylochus* (Ehr.) Ann. d. sci. nat., 3e série, Zool., T. 4.

EXPLANATION OF PLATE 9

Fig. 1. *Stylochoplana parasitica* sp. nov. × 12.
Fig. 2. Cocoon. × 15.
Fig. 3. Cocoon attached to the hyponotum of *Liolophura japonica* var. *tessellata.* × 1.
Fig. 4. Longitudinal section through the tentacle. × 75.
Fig. 5. Eye-spots. × 55.
Fig. 6. Longitudinal section through the genital organs. × 75.

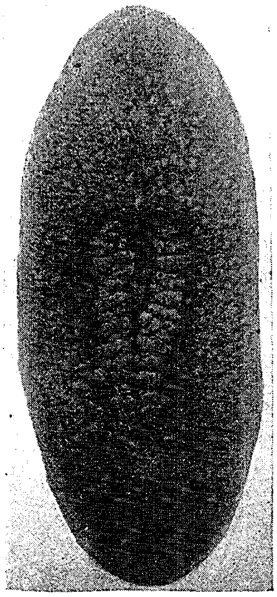
ABBREVIATIONS

cud common uterine duct, *egv* Lang's glandular vesicle, *i* intestine, *pn* penis, *pr* prostate gland, *sc* seminal canal, *shg* secretion of shell gland, *sp* sperms, *sv* seminal vesicle, *v* vagina, ♂ male genital pore, ♀ female genital pore.

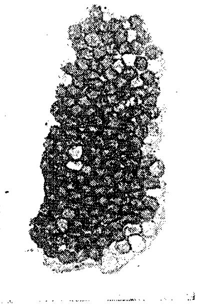
STYLOCHOPLANA PARASITICA

KOJIRO KATO

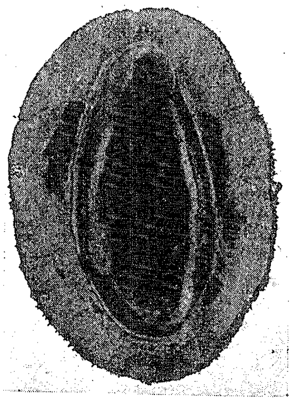
PLATE 9



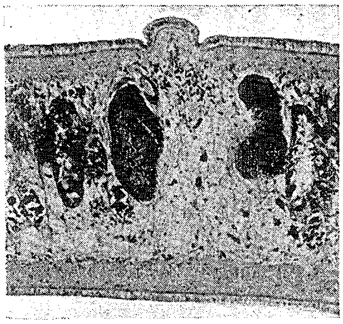
1



2

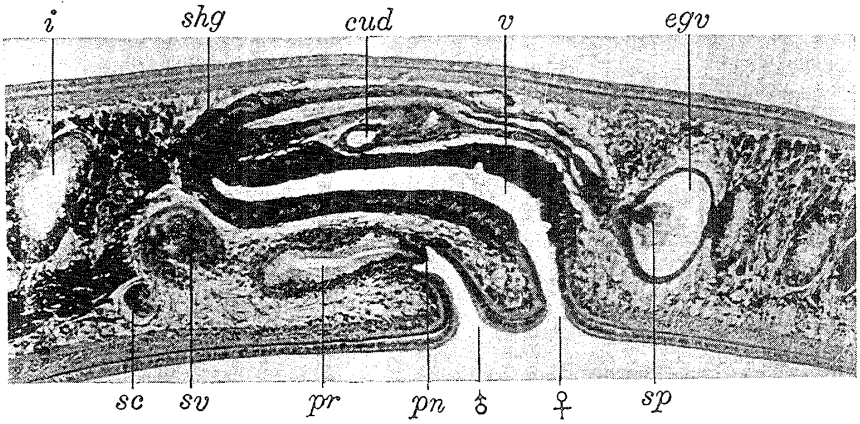


3



4

5



6